STUDIES ON AUSTRALIAN *THYSANOPTERA*: THE GENUS *IDOLOTHRIPS*, Haliday.

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(Plate iii.)

When Darwin visited Australia in 1836 on the memorable voyage of the "Beagle," among many other interesting specimens, he collected some Thrips remarkable for their great size, in comparison with other known species.

When the collections were distributed, these specimens were handed over to Mr. A. H. Haliday, who had recently published his classification of the British species of Thysanoptera. It was not, however, until sixteen years later that the descriptions were given to the world, in Walker's "List of Specimens of Homoptera in the Collection of the British Museum." Pt. iv. (p. 1096) Physapoda. In this Catalogue, Haliday's definition of the genus was given and three species described. But from a study of a large quantity of material it is evident to me that Haliday described the two sexes as distinct species, and a smaller and more variable form of the male as a third.

These interesting little creatures, though very plentiful and widely distributed in Tasmania and the eastern portion of Australia, seem to have escaped the notice of most collectors. From the study of an unlimited supply of living specimens in all stages of development, I am able to give the following account of their habits and life-history:—

Idolothrips spectrum, Haliday (♂).

I. marginata, Haliday (♀), and *I. lacertina*, Haliday (♂).

Eggs white, elongate and attached at the base to the surface of the dead leaves of Eucalypts in irregular rows, forming clusters of from 50 to 250 in number, touching each other so that they can be detached in an unbroken mass. Apex of egg rounded,

and curiously pitted like the top of a thimble; the young larvæ irregularly breaking the summit as they work their way out. Hiding among the eggs usually are to be found a great number of small semitransparent mites, which crawl on to the baby Thrips as soon as they are clear of the egg-shell; sometimes one Thrip may have six or seven clustered together on its back, and where the adult Thrips are confined among the infested eggs they also become covered with the mites. The adult Thrips often stand guard over the egg-masses, evidently with the idea of protecting them. In one case in particular, a male remained all day over the eggs; when touched, it crawled round to the under surface of the leaf, but returned as soon as the glass lid was replaced.

Larva, on emerging from the egg, about 1 line in length. General colour semitransparent, antennæ distinctly banded; eyes, sides of thorax and abdomen edged with bright red, with a slender dorsal stripe of the same colour down the centre of abdomen, merging together at the fuscous tubular segments at apex. Irregularly covered with long, scattered fine hairs. Head broad, antennæ thickened, eyes small, thorax long, abdomen short.

Larva: second stage.—Head more rounded, widest behind; antennæ long, eyes black, the rest semitransparent to dull white, marked with bright red on outer margin from behind the eyes to the base of anal segments, with a broad dorsal stripe commencing behind the pronotum, and merging into the side stripes at apex; transverse rows of spots on dorsal surface of thoracic and abdominal segments, and two apical tubular segments black.

Larva: third stage.—Head much larger, arcuate in front; antennæ long, slender and showing swelling at the apices of 3rd, 4th and 5th segments; eyes projecting. General colour fuscous, with apical portion of thorax and centre of abdomen semitransparent, with red markings showing, but confined to apical portion of abdomen; thorax and base of abdomen elongate-oval, tapering to the tip to a slender cylindrical tail, which consists of two tubular segments nearly as long as the thorax and rest of abdomen combined, fringed with scattered long hairs.

Larva: fourth stage.—Head longer than broad, deeply arcuate in front, with antennæ standing out in front as in the adult insect; eyes projecting. General colour dull white; with head, sides of pronotum, legs, antennæ, spots of dorsal surface and anal segments black. The broad red stripes down the centre and sides of dorsal surface very well defined, anal tubular segments fringed with long hairs at apex of first, but only lightly at tip of last.

Pupa.—Head narrow, broadest at hindmargin, the antennæ standing out on either side of head like short goat's horns; general form of thoracic and abdominal segment elongate-oval, tapering to the tip into a slender bristle-like appendage. Semi-transparent, richly blotched and marked with bright red, only black markings showing on small eyes and anal segments. Second pupal form well defined, like the adult insect, with the antennæ curved round the sides of head and hidden under the sides of prothorax, wing-covers well defined on back. The pupal forms do not appear to feed, but remain resting on the leaves, and move readily when disturbed.

Imago (♂).—Length from $\frac{1}{8}$ to $\frac{1}{2}$ inch in length, excluding antennæ. General colour black except the ochreous marking on antennæ, and red blotches on thorax, legs, and sides of abdominal segments. Wings pale horn-colour, with nervures ochreous and cilia smoky. Head finely transversely striated, long, cylindrical, rounded in front, thrice as long as broad; antennæ very long, slender, clubbed at apices of 3rd-6th segments and tapering at tips; eyes projecting, lateral ocelli large, in centre of inner margin of eye, almost touching; proboscis pointed, not quite reaching to fore margin of mesosternum; upper lip pointed. Prothorax irregularly hexagonal, not half the length of head, deeply arcuate on sides between mesothorax which, swelling out on the sides, is rounded to hindmargin of metathorax; meso- and metathorax combined slightly longer than broad. Legs long; wings, somewhat pointed at the extremities, with the central nervure extending a little beyond middle of wing, very thickly fringed with long cilia. Abdominal segments tapering to 8th segment, 8th forming

a short truncate base, to which is attached the tubular appendage nearly one-third of the length of the whole of abdomen.

Hab. — Sutherland, Kenthurst, Sydney, N.S.W. (W. W. Froggatt) - Gatton, Queensland (Mr. W. B. Gurney)—Hobart, Tasm. (Mr. A. M. Lea)— Melbourne, Vic. (Mr. C. French, Junr.).

The insects, in all stages of growth, are to be found at the end of August, sometimes in great numbers, by beating or shaking the dead foliage of Eucalypt bushes, where the trees have been cut down, and the leaves have remained attached to the twigs, forming a close shelter for them. When the dead leaves rest on the ground and are disturbed, the Thrips run about on the ground with the tip of the abdomen turned up over the back, much after the manner of the Staphylinidæ or Rove Beetles, for which at first sight they might easily be mistaken. Mr. Gurney was fortunate in finding a large number of leaves with the eggs attached to them; and I was thus enabled to watch the larvæ emerging from the eggs, and to note their development in all stages. As yet I have been unable to find how or upon what they feed, as there can be little or no substance (at least for the young larvæ) to devour on the dry Eucalypt leaves; but one larva after hatching remained enclosed under a watch glass for nine days without food. Placed upon flowers and fresh foliage, they at once crawl off and either rest on the sides of the jar or on the ground.

EXPLANATION OF PLATE III.

Idolothrips spectrum.

Fig. 1.—Eggs.
Fig. 2.—First larval form.
Fig. 3.—Second larval form.
Fig. 4.—Third larval form.
Fig. 5.—Perfect larva.
Fig. 6.—First pupal form.
Fig. 7.—Second pupal form.
Fig. 8.—Perfect insect (imago).